RESEARCH DEPARTMENT

Transmitting aerial for the Eastbourne v.h.f. television station

TECHNOLOGICAL REPORT No. E-097

1964/14

THE BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION

RESEARCH DEPARTMENT

TRANSMITTING AERIAL FOR THE EASTBOURNE V.H.F. TELEVISION STATION

Technological Report No. E-097
(1964/14)

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March 1964

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INTRODUCTION

The Eastbourne television relay station came into operation on 16th December 1963. It provides an improved service to Eastbourne, Willingdon, Polegate and Hailsham.

SUMMARY OF INSTALLATION

Site:	The site is at Combe Hill about 2·5 miles (3·8 km) north-west of Eastbourne, grid ref: TQ/582022, height 500 ft (152 m) a.m.s.l.
Support Structure:	The support structure consists of a 120 ft (37 m) square-section self-supporting tower oriented with one side on a bearing of 72° ETN.
General Arrangement:	See Fig. 1.
Channel:	Channel 5, with vertical polarization is used. Both vision and sound carriers are offset +16·875 kc/s.
Aerial:	The aerial consists of two tiers each of one vertical dipole mounted on a bearing of 68° ETN and spaced 7 ft 8 in (2·3 m) from the tower axis. The inter-tier spacing is 1·0λ and the mean height 105 ft (32 m) a.g.l. The tower side dimension at this height is 1 ft 3 in (0·38 m). There are independent main feeders to each dipole.
Power:	A translator with an output power of 10 W is used.
Templet and Horizontal Radiation Pattern (h.r.p.):	See Fig. 2 and Note.

Gain:	Mean intrinsic gain		3·3 dB
	Deduct: losses due to possible misalignment and distribution feeders		0·1 dB
	Mean net gain		3·2 dB
	Deduct: loss in main feeders (type RPC2603)	1·3 dB	
	network loss	0·6 dB	1·9 dB
	Mean effective gain		1·3 dB

Programme Link: The programme is obtained by direct reception of the Channel 1 (vertical polarization) transmissions from Crystal Palace. The receiving aerial consists of a double 3-element Yagi aerial mounted at a height of 70 ft (21 m), oriented on a bearing of 342° ETN. Protection against precipitation-static interference is given by the use of a shrouded receiving aerial in conjunction with the corona-protection spike and parasitic reflectors which surmount the tower.

Note: The aerial design was based on a theoretical prediction of the h.r.p. assuming a cylindrical support mast electrically equivalent to the square tower section. This approximation gives reasonable accuracy in view of the small electrical size of the tower section (0·085λ square). An experimental check of the h.r.p. was therefore unnecessary.

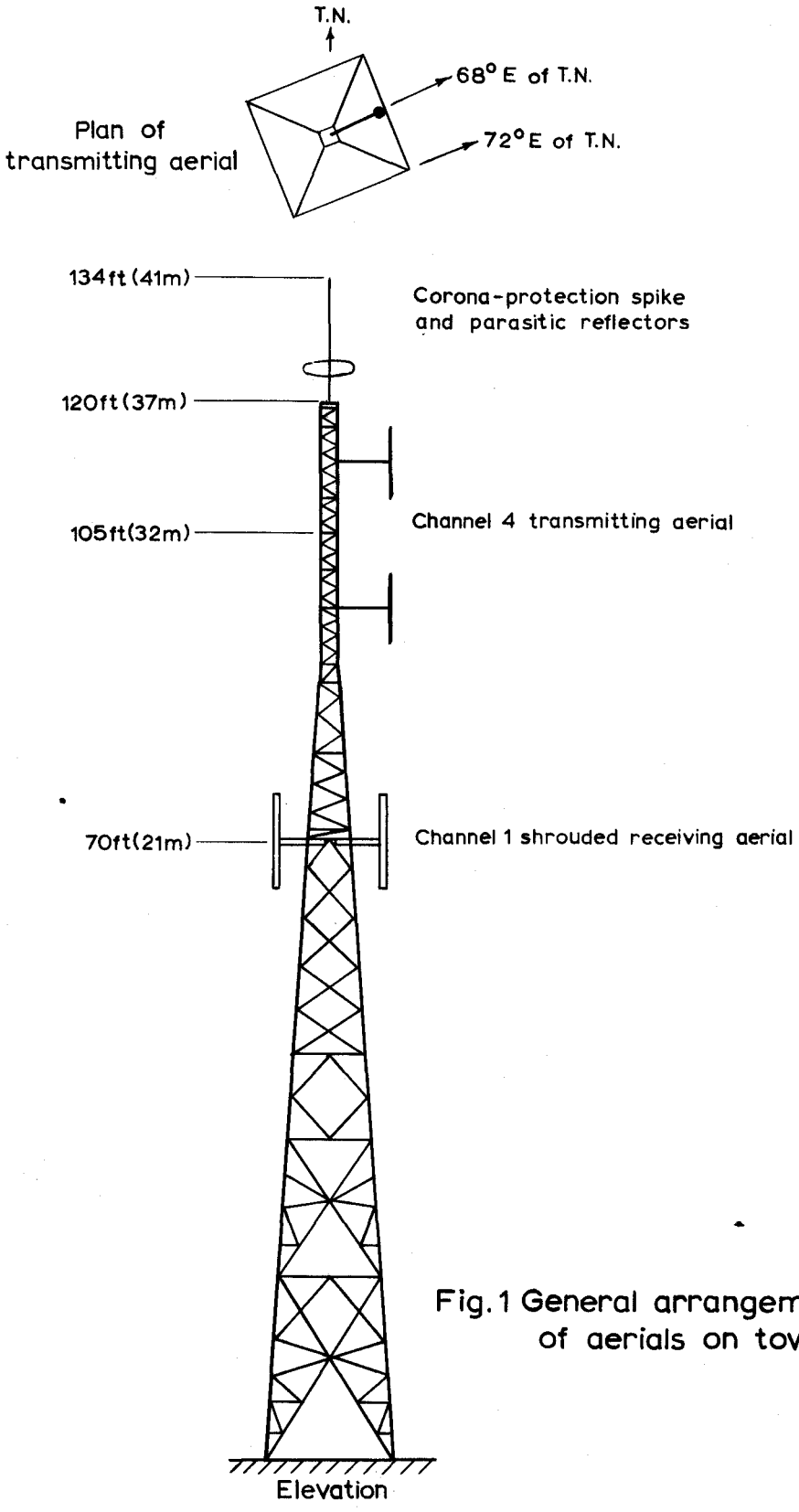

Fig. 1 General arrangement of aerials on tower

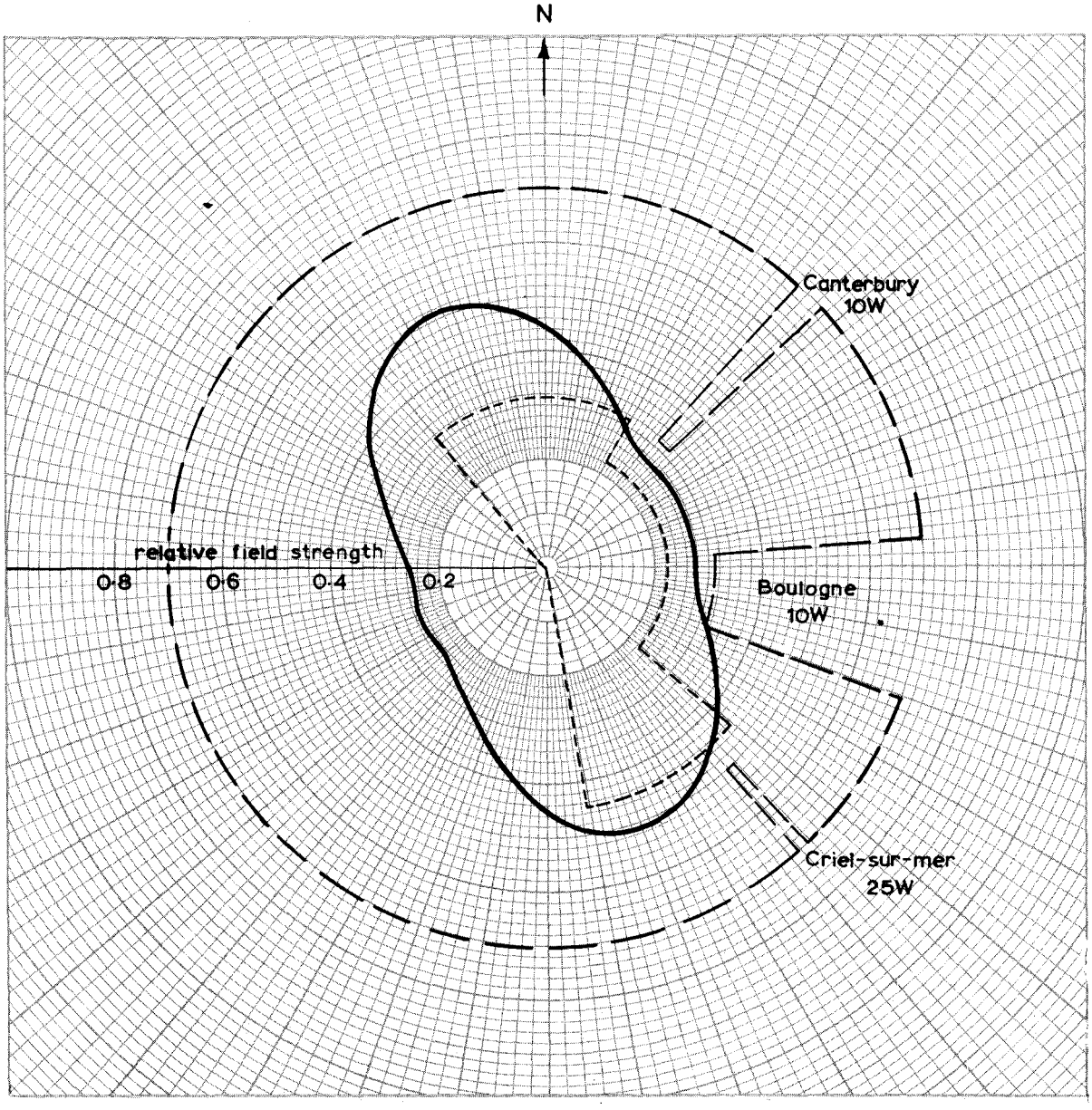

Fig. 2 Templet and horizontal radiation pattern

VERTICAL POLARIZATION

Channel 5 (Vision carrier 66·75Mc/s Sound carrier 63·25Mc/s)

Mean effective gain 1·3dB
Transmitter power 10W
Mean E.R.P. 13·5W

—— —— —— Maximum permissible E.R.P.
-------- Minimum desirable E.R.P.

Unit field corresponds to an E.R.P. of 100W

Printed by BBC Research Department, Kingswood Warren, Tadworth, Surrey